

**What is claimed is:**

1. A motor of rotor with built-in permanent magnet, which comprises of:

a rotor core, which is a cylindrical structure; said rotor core having a plurality of openings formed around a outer-skirt thereof, each of the openings having a top surface and a bottom surface parallel to each other; the top surface being adjacent to and extending along a contour of rotor core so as to form a side surface; an air gap with suitable distance being located between the side surface and contour of rotor core, and any two adjacent side surfaces being spaced-apart with a channel of suitable width; and

a plurality of permanent magnets, which shapes exactly match with the openings, and thus the permanent magnets can be inserted into and fitted with the openings.

2. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the permanent magnets are arranged in openings by way of interlaced magnetic poles.

3. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, motor further includes an annular stator, which is with a cylindrical capacity of suitable diameter; a circumference surface of the cylindrical capacity is furnished with teeth and slots, the teeth and the slots are interlaced located.

4. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the rotor core is made of permeability materials.

5. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the rotor core is an integrally formed cylindrical solid silicon steel.

6. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the rotor core is accumulated by a plurality of silicon steel sheet pieces.

7. The motor of rotor with built-in permanent magnet as cited in claim 6, wherein, one side surface of each silicon steel sheet piece is set a plurality of convex points, and one side surface of another relative silicon steel

sheet piece is set a plurality of concaves on relative places, the convex points and concaves are then matched each other by stamping when a plurality of silicon steel sheet pieces are accumulated.

5 8. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the side surface is a surface with straight edge.

9. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the side surface is a surface with arc edge.

10 10. The motor of rotor with built-in permanent magnet as cited in claim 9, wherein, a curvature of the arc surface is same as circumference contour of the rotor core.

11. The motor of rotor with built-in permanent magnet as cited in claim 1, wherein, the opening is further set an adjacent surface, which connects the side surface and the bottom surface.

15 12. The motor of rotor with built-in permanent magnet as cited in claim 11, wherein, the adjacent surface is a surface with straight edge.

13. The motor of rotor with built-in permanent magnet as cited in claim 11, wherein, the adjacent surface is a surface with arc edge.

14. The motor of rotor with built-in permanent magnet as cited in claim 13, wherein, the arc surface is a single arc surface.

20 15. The motor of rotor with built-in permanent magnet as cited in claim 13, wherein, the arc surface is a multiple arc surface.

16. A motor of rotor with built-in permanent magnet, which comprises of:

25 a rotor core, which is a cylindrical structure; said rotor core being formed with a plurality of openings around an outer-skirt thereof, and each opening having a top surface and a bottom surface parallel to each other; the top surface being adjacent to an outer contour of rotor core; and a plurality of permanent magnets, which shapes matching with openings, and thus the permanent magnets being able to be inserted and fitted in the openings;

30 wherein, the top surface extends along the outer contour of the rotor core to form a side surface; an air gap with suitable distance being

located between the side surface and the contour of rotor core, and any two adjacent side surfaces being spaced-apart with a channel of suitable width.

5 17. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, a plurality of permanent magnets are arranged in openings by way of interlaced magnetic poles.

10 18. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the motor further includes an annular stator, which is with a cylindrical capacity of suitable diameter; a circumference surface of the cylindrical capacity is with at least one tooth and one slot, the tooth and the slot are interlacing located.

19. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the rotor core is made of permeability materials.

15 20. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the rotor core is a cylindrical solid silicon steel.

21. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the rotor core is accumulated by a plurality of silicon steel sheet pieces.

20 22. The motor of rotor with built-in permanent magnet as cited in claim 21, wherein, one side surface of each silicon steel sheet piece is set a plurality of convex points, and one side surface of another relative silicon steel sheet piece is set a plurality of concaves on relative places, the convex points and concaves are then matched each other when a plurality of silicon steel sheet pieces accumulated.

25 23. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the side surface is a surface with straight edge.

24. The motor of rotor with built-in permanent magnet as cited in claim 16, wherein, the side surface is a surface with arc edge.

30 25. The motor of rotor with built-in permanent magnet as cited in claim 24, wherein, a curvature of the arc surface is same as circumference contour.

26. The motor of rotor with built-in permanent magnet as cited in claim 16,

